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REMARKS

Entry of this Amendment is proper because it does not raise any new issues requiring further search by the Examiner, narrows the issues on appeal, and is believed to place the present application in condition for immediate allowance.

Claims 1-44 are all the claims presently pending in the application. Claims 1-11, 39, 40, 42, and 43 are elected. Claims 1-5, 39, 40, 42, and 43 are generic to all species of the invention. Claims 12-28, 41, and 44 are withdrawn from consideration as being directed to non-elected species. Claims 1, 42, and 43 are amended to incorporate the features of original claim 2 to define more clearly the features of the present invention. Claim 2 is amended to define more clearly the features of the present invention.

It is noted that the claim amendments are made only for more particularly pointing out the invention, and not for distinguishing the invention over the prior art, narrowing the claims or for any statutory requirements of patentability. Further, Applicants specifically state that no amendment to any claim herein should be construed as a disclaimer of any interest in or right to an equivalent of any element or feature of the amended claim.

Claims 2 and 3 stand rejected under 35 U.S.C. § 112, second paragraph. Claims 1-7, 39, 42, and 43 stand rejected on prior art grounds under 35 U.S.C. § 103(a) as being obvious over Liefke ("An Extensible Compressor for XML Data, Liefke SIGMOD Record, Vol. 29, No. 1, March 2000). Claims 8-11 and 40 stand rejected on prior art grounds under 35 U.S.C. § 103(a) as being obvious over Liefke in view of WAP Binary XML Content Format, W3C Note June 24, 1999 (hereinafter "W3C").

These rejections are respectfully traversed in the following discussion.

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I. THE CLAIMED INVENTION

The claimed invention, as defined for example, by independent claim 1, is directed to a method of compressing an extensible markup language (XML) document, including compressing an XML document and its associated schema information such that information in a markup portion therein is maintained in a compressed form to allow the document to be reconstructed, wherein, during the compressing, the markup portion and a non-markup portion of the document are separated, and the non-markup portion is compressed using a first compression method and the markup portion is compressed using a second compression method. The mark-up portion includes structured component information and the schema information associated with the document is used with compressing the structure component to obtain a predetermined compression rate while simultaneously retaining the structure.

Hence, the present invention not only takes advantage of the separation of the structure and data of an XML document, but it also takes advantage of the associated schema (e.g., DTD) of the document to perform optimization (e.g., see specification at page 4, lines 19-21). The schema describes the constraints on the structures, possible values, and occurrence restrictions of attribute values and elements. The compression algorithm, once it knows that there is a schema associated with the document, takes advantage of this and produces further compression of the data.

The claimed invention provides an efficient compression algorithm for XML documents in which the XML documents are compressed, and such that the structural information will be kept in the compressed form so that the documents can be easily

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reconstructed. The invention provides a lossless compression algorithm that gets as close as possible to the ZLIB algorithm. Hence, with the claimed invention, the markup (structure) and non- markup (data) can be separated , and the non-markup component can be compressed using ZLIB and the markup component can be compressed using binary encoding (e.g. see specification at page 5, lines 4-10).

Thus, with the unique and unobvious aspects of the claimed invention, the schema information (the DTD associated with the document) can be used to compress the structure component and obtain higher compression rate while simultaneously retaining the structure. Further, the claimed invention provides better compression rates for small documents (like eBusiness transactions) than GZIP and other conventional schemes. (E.g. see specification at page 5, lines 10-15).

II. REJECTION UNDER 35 U.S.C. § 112, SECOND PARAGRAPH

Claims 2 and 3 stand rejected under 35 U.S.C. § 112, second paragraph.

As for the rejection of claim 2, the Office Action states that claim 2 does not provide sufficient "comparative" basis for the limitation "a predetermined higher compression rate".

As a preliminary matter, Applicants note that some of the features of original claim 2 have been incorporated into claim 1. Claim 2 also has been amended to define more clearly the features of the present invention. Accordingly, Applicants respectfully submit that the rejection under 35 U.S.C. § 112, second paragraph, should be overcome.

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In view of the foregoing, Applicants submit that a person of ordinary skill in the art clearly would know the metes and bounds of the subject matter of claims 2 and 3 the Examiner is respectfully requested to reconsider and withdraw this rejection.

III. THE LIEFKE REFERENCE

Claims 1-7, 39, 42, and 43 stand rejected on prior art grounds under 35 U.S.C. § 103(a) as being obvious over Liefke ("An Extensible Compressor for XML Data, Liefke SIGMOD Record, Vol. 29, No. 1, March 2000). For at least the following reasons, Applicants respectfully traverse this rejection.

Applicants incorporate by reference the remarks submitted in the Amendment under 37 C.F.R. § 1.111 filed on April 12, 2004, for the Examiner's convenience.

In the Response to Arguments, the Examiner alleges that:

*just because the invention of Liefke does not require DTD as a necessity in order to function, the invention still reads on the limitation of **compressing an XML document and its associated schema information** as outlined in the rejection of claim 1 under 35 USC 103(a); specifically, that we have implemented a compressor ...for XML data (page 57, lines 1-2) and that it ...preserves the input XML file faithfully, including element order ...the DTD, etc. (page 57, 1st column, lines 6-9)*

(see Office Action at page 9, numbered paragraph 27; emphasis original).

Applicants respectfully disagree with the Examiner's position for several reasons.

As mentioned above, Applicants note that independent claims 1, 42, and 43 have been amended to incorporate features of original claim 2. No new matter has been added and no further search should be necessary since the Examiner has already considered and searched the prior art with respect to these features of claim 2.

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Applicants respectfully note that the Examiner has not responded to Applicants traversal position with respect to claim 2 (which has now been incorporated into independent claims 1, 42, and 43), as set forth in the Amendment under 37 C.F.R. § 1.111 filed on April 12, 2004 at page 16, lines 7-18.

Thus, Applicants reiterate that Liefke, nor the prior art in general, provides a reasonable motivation or suggestion for modifying Liefke to arrive at the claimed invention, as recited in independent claim 1.

On the contrary, since Liefke specifically discloses that it “does not need a DTD in order to compress”, Applicants submit that Liefke clearly does not contemplate (or for that matter, disclose or suggest) the claimed invention, but instead, teaches away from the claimed invention (e.g., see Liefke at page 57, first column, first paragraph, lines 6-7; emphasis added).

In the present Office Action, the Examiner states that “*the invention of Liefke does not require DTD as a necessity in order to function...*”(see Office Action at page 9, numbered paragraph 27; emphasis original).

Contrary to the Examiner’s position, Applicants submit that, by explicitly stating that it does not need DTD in order to compress, Liefke clearly does not disclose or suggest “wherein said schema information associated with the document is used with compressing the structure component” as recited, for example, in independent claim 1.

Moreover, in the Response to Arguments, the Examiner alleges that the knowledge generally available to one of ordinary skill in the art is being relied upon to provide the motivation or suggestion for modifying Liefke to arrive at the claimed invention.

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However, Applicants submit that merely stating that the knowledge generally available in the art is being used as the motivation fails to establish a *prima facie* case of obviousness.

That is, the Examiner has not established *how* or *why* a person of skill in the art, based on such alleged knowledge generally available to one of ordinary skill in the art, would modify Leifke, which specifically states that a DTD is not needed in order to compress, to arrive at the claimed invention, which recites that “said schema information associated with the document is used with compressing the structure component” (emphasis added).

Applicants submit that mere conclusory statements alone are not sufficient to establish the alleged obviousness of the claimed invention.

In view of Leifke’s specific teaching that a DTD is not needed in order to compress, Applicants request that the Examiner cite a reference to support the assertion that knowledge generally available in the art would have suggested modifying Leifke, in a manner contrary to its own teachings, to arrive at the claimed invention.

That is, the claimed invention, which uses the DTD to compress, clearly is different from the invention of Leifke, which clearly states that it does not use DTD to compress.

In contrast to Leifke, the unique and unobvious features of the present invention not only take advantage of the separation of the structure and data of an XML document, but also take advantage of the associated schema of the document to perform optimization (e.g., see specification at page 29, lines 1-7).

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That is, the schema (e.g., DTD as defined, for example, in dependent claim 3) describes the constraints on the structures, possible values, and occurrence restrictions of attribute values and elements. The compression algorithm, once it knows that there is a schema associated with the document, takes advantage of this and produces further compression of the data.

Therefore, with the unique and unobvious aspects of the claimed invention, the schema information (e.g., the DTD associated with the document) can be used to compress the structure component and obtain a higher compression rate while simultaneously retaining the structure and the present invention can provide an efficient compression algorithm for XML documents in which the XML documents are compressed, such that the structural information can be kept in the compressed form so that the documents can be easily reconstructed (e.g., see specification at page 4, lines 1-7).

Leifke does not disclose or suggest these features of the claimed invention, or for that matter, does not even mention the advantages derived from the unique and unobvious claimed combination.

For the foregoing reasons, Applicants submit that a reasonable motivation for modifying Leifke to arrive at the claimed invention has not been established, and that there are elements of independent claim 1 that clearly are not taught or suggested by Liefke.

Accordingly, independent claim 1 clearly is patentable over Liefke. Therefore, Applicants request that the Examiner withdraw this rejection.

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Applicants submit that independent claims 42 and 43 also are patentable over Liefke for somewhat similar reasons as claim 1.

Applicants submit that claims 2-7 and 39 also are patentable by virtue of their dependency from independent claim 1, as well as for the additional features recited therein.

For at least the following reasons, Applicants submit that there are elements of the claimed invention that clearly are not taught or suggested by Liefke. Therefore, the Examiner is respectfully requested to withdraw the rejection of claims 1-11, 39, 40, 42, and 43.

IV. THE W3C REFERENCE

Claims 8-11 and 40 stand rejected on prior art grounds under 35 U.S.C. § 103(a) as being obvious over Liefke in view of WAP Binary XML Content Format, W3C Note June 24, 1999 (hereinafter "W3C"). For at least the following reasons, Applicants respectfully traverse this rejection.

In the Response to Arguments set forth in the present Office Action, the Examiner responds to Applicants arguments merely by citing case law (e.g., In re Keller and In re Van Geuns), without further explanation as to why such case law is applicable in this case (see Office Action at page 10, numbered paragraphs 28 and 30).

That is, the Examiner has not responded to Applicants specific arguments set forth in the Amendment under 37 C.F.R. § 1.111 filed on April 12, 2004, at pages 17-18.

Thus, Applicants respectfully reiterate these traversal positions below and request that the Examiner properly respond to Applicants positions.

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As set forth above, Applicants submit that it would not have been obvious to modify Liefke to arrive at the claimed invention recited in independent claim 1, nor has the Office Action established the requisite motivation for such a modification.

Moreover, W3C (which is discussed by Applicants in the specification at page 7, lines 15-16) also does not provide a reasonable motivation or suggestion for modifying Liefke to arrive at the claimed invention.

For example, the Examiner alleges that it would have been obvious to combine Liefke with W3C to arrive at the claimed invention, since Liefke states that XMILL allows users to combine existing compressors in order to compress heterogeneous XML data and because such a combination would allow users of Liefke the benefit of a binary XML content format designed to reduce the transmission size of XML documents, allowing more effective use of XML data (see Office Action at pages 7-8, bridging paragraph).

However, as Applicants describe in the specification at page 7, lines 19-21, the binary encoding component which retains the structure occupies approximately twice as much space as the ZLIB equivalent that loses structure.

On the other hand, Liefke specifically discloses that, although GZIP is referred to throughout the document, it is in fact the ZLIB library function (e.g., see Liefke at page 58, second column, lines 1-3; see also Footnote 4).

Moreover, when discussing the compression of the structure, Liefke states that "gzip" compresses "the structure container extremely well" (e.g., see Liefke at page 59, first column, third paragraph, lines 3-4). Thus, Liefke provides no reasonable motivation to replace the GZIP (or ZLIB) with a binary format.

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Accordingly, Applicants reiterate that it would not have been obvious to combine the binary XML content format of W3C with Liefke for the purpose of reducing the transmission size of XML documents, as alleged by the Office Action.

Applicants respectfully submit that a person of ordinary skill in the art would not have been motivated to modify Liefke in view of M3C to arrive at the claimed invention, absent impermissible hindsight, and the Examiner is respectfully requested to withdraw this rejection.

V. REQUEST FOR REJOINDER OF NON-ELECTED CLAIMS

Applicants respectfully request that the Examiner rejoin and allow non-elected claims 12-38 at least by virtue of their dependency from generic claim 1, which should be allowable for the reasons set forth above.

VI. FORMAL MATTERS AND CONCLUSION

In view of the foregoing, Applicants submit that claims 1-44, all the claims presently pending in the application, are patentably distinct over the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

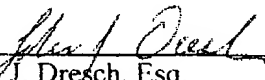
Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic or personal interview.

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The Commissioner is hereby authorized to charge any deficiency in fees or to credit any overpayment in fees to Assignee's Deposit Account No. 09-0441.

Respectfully Submitted,

Date: August 16, 2004

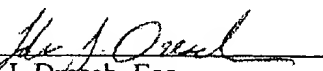

John J. Dresch, Esq.
Registration No. 46,672

Sean M. McGinn, Esq.
Registration No. 34,386

McGinn & Gibb, PLLC
8321 Old Courthouse Road, Suite 200
Vienna, VA 22182-3817
(703) 761-4100
Customer No. 21254

CERTIFICATE OF TRANSMISSION

I certify that I transmitted via facsimile to (703) 872-9306 the enclosed Amendment under 37 C.F.R. § 1.116 to Examiner Nathan Hillery on August 16, 2004.


John J. Dresch, Esq.
Registration No. 46,672

Sean M. McGinn, Esq.
Registration No. 34,386